FLIGHT

The AIRCRAFT ENGINEER & AIRSHIPS

First Aero Weekly in the World

Founder and Editor: STANLEY SPOONER

A Journal devoted to the Interests, Practice, and Progress of Aerial Locomotion and Transport

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Club Secretaries and others desirous of announcing the dates of important fixtures are invited to send particulars for inclusion in the following list:—

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Dec. 15 .... M. E. Dewoitine. "The Advantages of Metal Construction," before Inst.Ae.E.

Dec. 16 .... Air Vice-Marshal Sir W. Sefton Brancker. "Air Communications in the Middle East," before Royal United Service Institution.

1926

Jan. 12 .... Mr. C. Howarth. "Some Aspects of Full-Scale Experiments," before Inst.Ae.E.

Jan. 26 .... Lieut. Olechnovitch. "The Care and Maintenance of Tools as an Important Factor in Workshop Routine," before Inst.Ae.E.

Feb. 9 .... Informal Meeting, Inst.Ae.E.

Feb. 23 .... Mr. O. E. Simmonds, M.A., A.F.R.Ae.S., M.I.Ae.S. "The Development of Civil Marine Aircraft," before Inst.Ae.E.

Feb. 25 .... Mr. A. J. Cobham. "Long-Distance Aeroplane Flights," before R.Ae.S.

Mar. 9 .... Informal Meeting, Inst.Ae.E. and Annual Meeting.

EDITORIAL COMMENT.

Aviation and Our Public Schools

EVERY great deal has been written and spoken during the last few years of the importance to the British Empire of developing in the general public the "air sense," as it has been called, in order to ensure the sound progress of aviation, both military and civil, and the inauguration of the light 'plane club scheme is, of course, a direct practical step towards attaining the desired end. That the light 'plane club scheme in itself suffices, nobody will seriously claim. It is, or should be, one link in the chain, and, if success is to be won, it is very necessary to exploit every avenue likely to lead to further progress. The formation of University Squadrons is another link, and a most excellent one, but does not commence, from the educational point of view, until those concerned have, in a measure, already chosen their life's work. At the other end of the scale we have, or are about to have, the Auxiliary Air Force squadrons and centres; again a most excellent link in the chain. But in all these we are dealing in the main with those who have already attained man's estate, and whose outlook upon life has, therefore, presumably already been more or less formed. What is still lacking is the inculcation of the vast possibilities of the air into the plastic minds of those still in the receptive stage and to whom after all, we shall have to look for our future in the air.

It is therefore with the very greatest satisfaction that we learn of a scheme, initiated by Major Victor Stammers and Major H. Hemming, recently submitted to the Air Ministry by the Air League of the British Empire. An outline of this scheme is published elsewhere in this issue of FLIGHT, from which it will be seen that it has for its object to send a pilot-lecturer on tour to some of our public schools, there to give lectures on aviation, demonstration flights on a suitable machine, and passenger flights to such of the boys as are willing and have obtained the consent of their parents and the headmaster of the school.

We realise that the scheme may not be quite so easy to carry out as would appear at first sight. The initial difficulty will be to obtain the consent of the parents and that of the headmasters. The former are likely to be among those who regard aviation as "a pursuit of adventure and great danger, with fantastical military and naval possibilities, and of very doubtful commercial value," as expressed by Major Stammers in his notes dealing with the scheme. The headmasters may to some extent share these views, and may also be guided and influenced by other considerations. Yet we believe that if the scheme is handled in the right way, and carries with it the official cachet of the Air Ministry, the obstacles should not be insuperable. We understand that Mr. Alan Butler, who has already done so much for aviation by his very practical interest in the subject, expressed by his purchase of a number of aeroplanes for his personal use and by his flying all round Europe in his own machine, has announced his willingness to undertake, on behalf of the Aircraft Operating Company, of which he is chairman, the equipment and maintenance of the aeroplane on a basis of a fee of one guinea per boy for the course of lectures and the flight terminating the course. The only stipulation made, we understand, is that the Air Ministry should guarantee those undertaking the scheme against loss up to approximately £3,000.

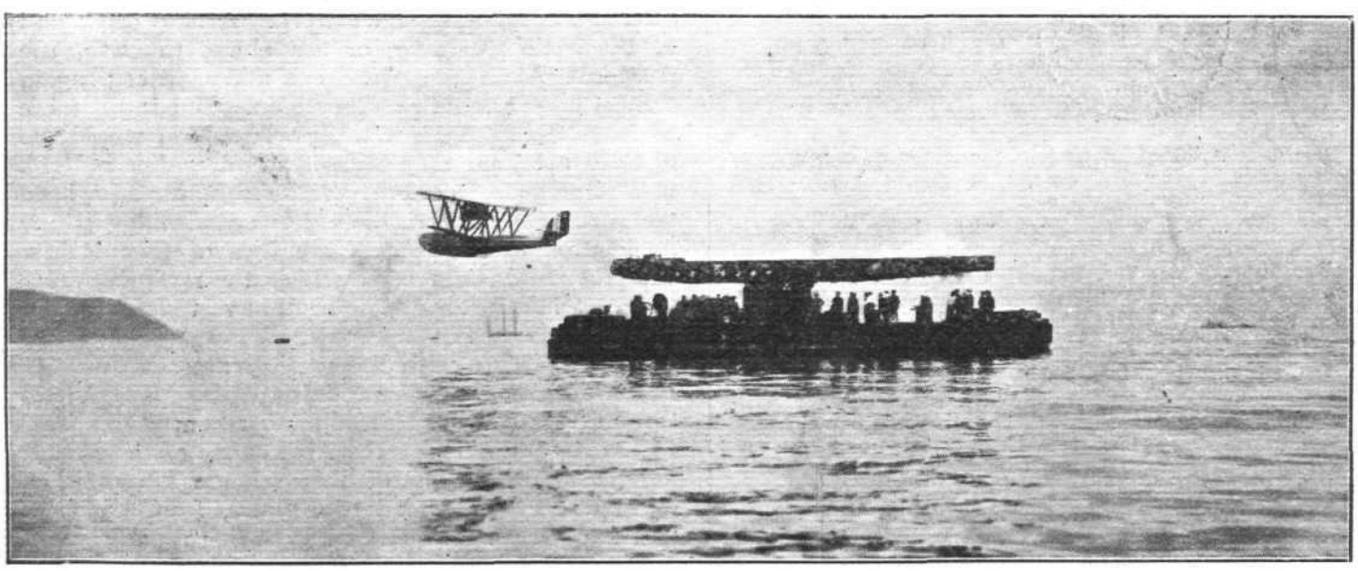
As there can, we think, be no possible doubt as to the value of such a scheme, provided it is judiciously managed, it is to be hoped that the Air Ministry will see its way to assist in the manner suggested. Rather perhaps, should we express the hope that the Treasury, may be convinced, since we have very little doubt that the Air Ministry will be more than willing to help, being the party to gain most by the success of such an arrangement. It should be clearly understood that those who are prepared to organise the scheme are not expecting to, nor even desirous of, making any profit whatever out of the scheme, although if it is successful and is found later to be able to pay its way without Government guarantee, so much the better. It is not difficult to visualise very important and far-reaching developments of the project, but the modest start at present suggested should meet the case in its earlier stages.

The Royal Aero Club House Dinners

The first of the monthly house dinners of the Royal Aero Club must be recorded as a great success. The address delivered by Mr. C. R. Fairey was of quite exceptional interest, whether or not one agreed with everything said, and, as Sir Philip Sassoon stated, it was difficult not to agree with Mr. Fairey, who is a most convincing talker. Mr. Handley Page was at the top of his form, and disguised some very telling points under a cloak of the most charming witticisms. Other speakers contributed valuable views, and altogether the evening is likely to prove, as we ventured last week to predict it would be, a red-letter day in the history of the Royal Aero Club.

At this first dinner exactly the right tone was struck, the discussion being neither too commonplace nor too technical. If subsequent dinners are kept in the same vein they will certainly not prove too dull, neither will they err on the side of the too technical, and thus will not, as Col. McClean pointed out, trespass in the slightest upon the ground already covered by the Royal Aeronautical Society.

The next monthly club dinner will be held on December 16, when the subject for discussion is to be "Civil Aviation," the debate to be opened by Air Vice-Marshal Sir Sefton Brancker. We note that the attendance at the dinner is to be limited in the future to 60 seats, which seems rather regrettable, since the first monthly dinner gave every evidence of the probability of a vastly larger attendance in the future. If the attendance is in future to be limited to this relatively small number, there would seem to be a danger that the dinners may fail to achieve as much good as they otherwise would, although the question of holding the dinners elsewhere than on the club premises would naturally give rise to various problems. In any case, we can see very keen competition for the 60 seats at the next dinner, and can only express the hope that it will be as successful as the last one.



ITALY ADOPTS THE CATAPULT: This photograph, kindly sent to us by General A. Guidoni, Italian Air Attache in London, shows the catapult recently tested at the Navy Yard at Spezia. The catapult, which is similar in design to those used in America, was designed by Major Gagnotto. The weight of the Macchi flying-boat being launched was 3,000 lbs., and its speed 100 m.p.h.

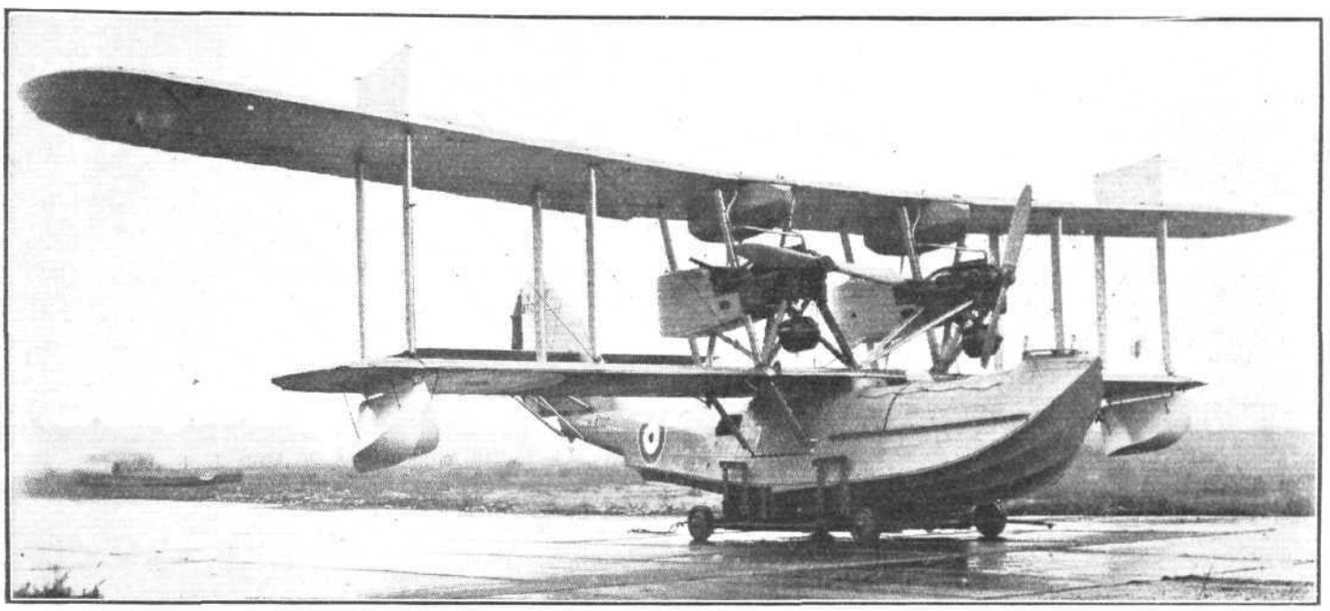
FLIGHT

THE "KINGSTON" METAL-HULL FLYING BOAT

An Interesting Development by the English Electric Company

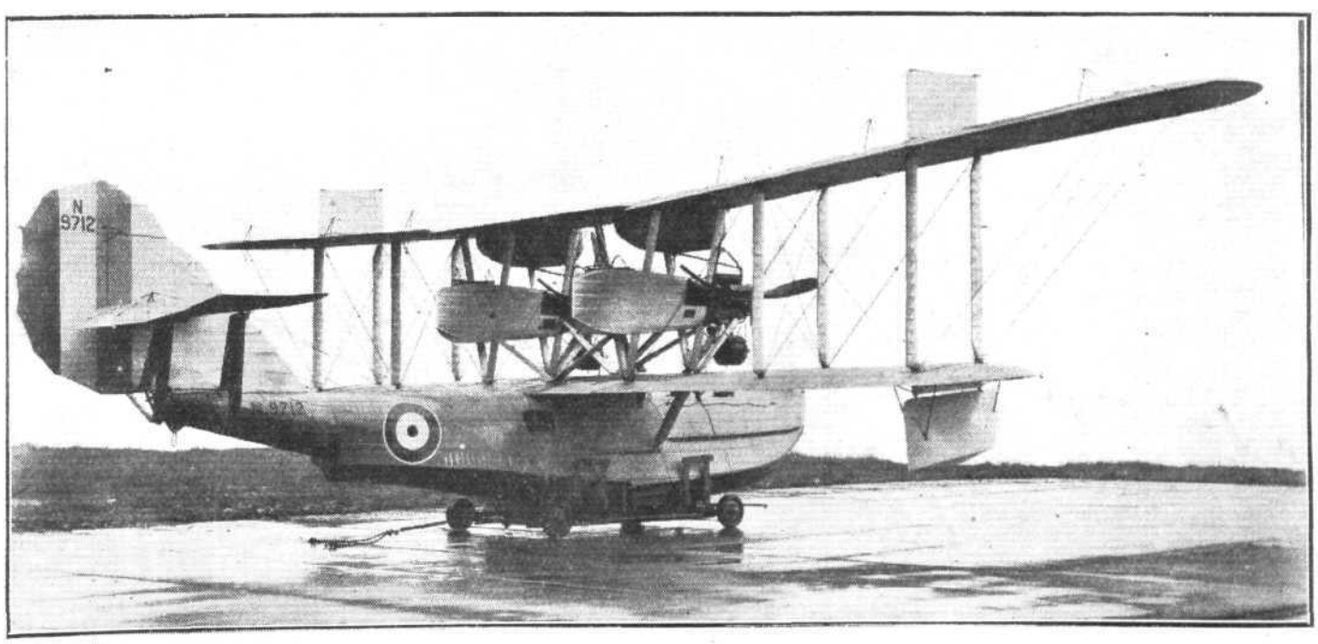
OWING to the fact that they have all been constructed for the Air Ministry, it has not been possible to refer in great detail to most of the machines produced by the English Electric Company at their aircraft works at Preston, Lancashire. From time to time we have been able to publish photographs of such machines as have been released for publication by the Air Ministry, and this week we are able to give a general illustrated description of a fairly recent type, the "Kingston," the latest edition of which was successfully tested a few weeks ago.

The English Electric Company's "Kingston" is a five-seater reconnaissance boat type fitted with two Napier "Lion" engines. In its original form the machine had the usual resilient mahogany-planked hull, but in the more recent development under review, the boat hull is an entirely new departure, not only because it is of metal construction, but equally on account of certain unusual features in its design. The special features of the "Kingston," and this applies to the earlier wooden-hull type as well as to the more recent metal-hull machine, are found in the arrangement of the engines and in the disposition of the wings, the upper of which has a pronounced dihedral, while the lower wing is perfectly straight.

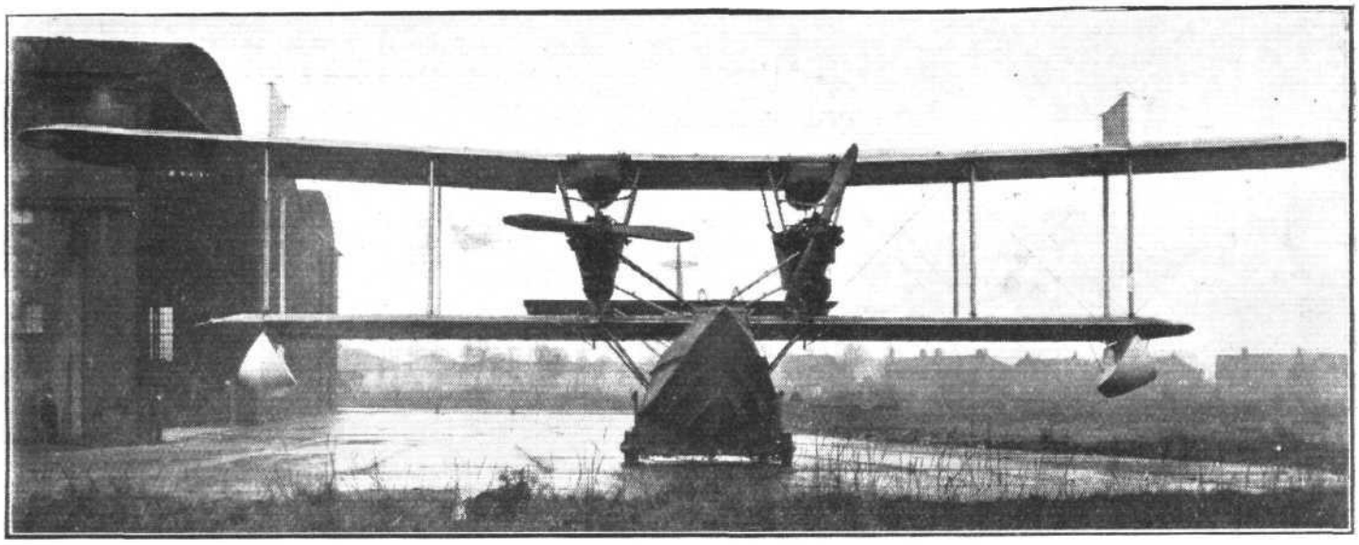


THE "KINGSTON" METAL-HULL FLYING BOAT: This photograph shows the machine in three-quarter front view, and illustrates several unusual features, particularly as regards the form of the planing bottom ahead of the step.

Although it is not permitted to give full detailed dimensions of the "Kingston," it may be stated, in order to give some idea of the size of the machine, that the top plane has a span of 85 ft. 6 in. The wings are of normal construction, that is to say, with wooden spars and ribs, and metal fittings. The



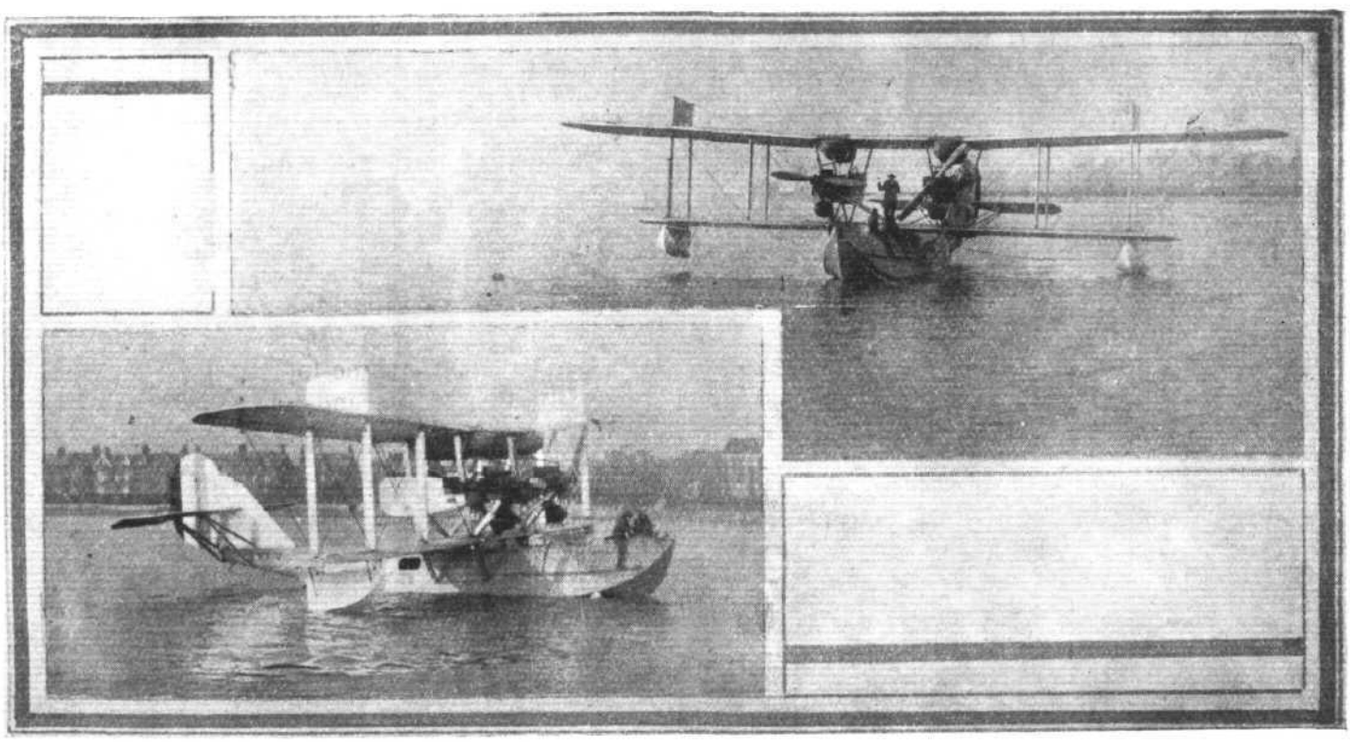
THE "KINGSTON" METAL-HULL FLYING BOAT: Three-quarter rear view. Note the unusual shape of the engine nacelles.



THE "KINGSTON" METAL-HULL FLYING BOAT: The corrugations, or waves, in the transverse sections of the planing bottom, as well as the pronounced "tumble home" to the sides, are well brought out in this front view. The engines are Napier "Lions."

wing section used is that known as T.64, which is a fairly thick section, giving room for spars of considerable depth. Both upper and lower planes are built in three sections. That is to say, that there are top and bottom centre sections permanently attached to the hull and to the engine interplane struts respectively, and the end portions of the wings are attached to these centre sections by horizontal pin joints in front and rear spars. As already mentioned, the end portions of the top plane are set at a pronounced dihedral angle, and further fin surface is provided by covering in the king posts supporting the top bracing of the top plane overhangs. The lower plane, the centre-section of which runs right across the top of the hull, is perfectly straight, *i.e.*, without dihedral, with the result that the wing tip floats have a minimum of exposed supports. These wing tip floats are of unusual design, as will be seen in the photographs, and are remarkable for the fact that they are of approximately triangular section. The advantages claimed for this type of wing tip float, which has been developed by Mr. W. O. Manning, the firm's chief designer and engineer, and patented by the English Electric Company, is that it gives maximum displacement almost immediately on contact with the water. From the photographs of the machine resting on the water, for which we are indebted to the *Lancashire Daily Post*, it will be seen that the "Kingston" floats very high in the water and that the machine heels over but very little when at rest. We understand that the machine when at rest on a calm sea is practically neutral as regards stability, the wide beam of the hull over the chines serving to bring about this condition.

The arrangement of the interplane struts in the neighbourhood of the engines is somewhat unusual, and has been designed with a view to providing good accessibility for running repairs, as well as to render a change of engines easy. The oil tanks are mounted immediately behind the engines, while the petrol tanks are, it will be seen, suspended from the top centre-section so as to give direct gravity feed. The water circulation system is of somewhat unusual type, but may not at present be described in detail. The Air Ministry type of radiators are mounted below the engines, between the front engine struts, and it cannot be said that this type of radiator improves the appearance of the machine. Rearwards, the two engine nacelles are prolonged to form cockpits for two gunners, and it would appear that a particularly excellent field of fire should be obtained from these two positions. A



Photos. by "Lancashire Daily Post"

On the sea: Two views of the English Electric Co.'s "Kingston." The boat is notably high in the water, and the small angle of heel while at rest should be noted.

cockpit for a third gunner is, it will be seen, provided for in the extreme nose of the hull, where in its raised position the cockpit should be well clear of flying spray.

The tail surfaces of the " Kingston " are of fairly orthodox design and construction, and it may be stated that the section employed in the tail plans and elevators is R.A.F. 14, inverted. A tail plane trimming gear is provided so as to enable the pilot to trim his machine at all flying speeds.

Hitherto our remarks have been equally applicable to the older and newer type of " Kingston."

When, however, we come to describe the hull, considerable departures are to be recorded. Not only is the hull of the latest " Kingston " of all-metal construction, the material used being mainly Duralumin, but the hull shape differs materially from that of the older machine.

Although following standard practice as regards its two steps, the lines of the " Kingston " metal hull are unusual. To begin with, it will be noticed that the stern portion of the hull does not show the usual up-tilted appearance. Instead of the cocked-up tail usually found, Mr. Manning has, in the metal hull of the " Kingston," continued the smooth lines of the hull, and has obtained the same effect, *i.e.*, that of getting the tail well clear of the water, by making the aft step of rather greater depth than usual.

In the design of the front step and of the bows of the hull Mr. Manning has struck out along entirely original lines. To begin with, the main transverse frames of the hull, or rather of the planing bottom, do not show the smooth V usually found, but are divided on each side into three flutings or corrugations. The longitudinal stringers which provide the ridges of these corrugations run right up to the stem, where they, as well as the chines, are swept upwards at rather a pronounced sweep. The high flaring bows have the effect of giving a " dry " machine, while the corrugations break the bow wave into three separate smaller waves, which curl over independently. The result seems to be that the wave, instead of being flung far out to the side, is curled under in three smaller sections without flinging up much spray.

About the construction of the metal hull but little may be said, but we may state that it is of the single shell type, with athwartship web frames and fore-and-aft stringers. Light auxiliary frames run from chine to chine, serving to stiffen the plating of the topsides. The fluted planing bottom, too, results, we understand, apart from the cleaner running which it gives, in greater structural strength, and is supported fore and aft by a number of intercostals. The hull planking is in the form of Duralumin sheets riveted to frames and stringers. From the front view of the machine it will be noted that the topsides of the hull have a pronounced tumble home, and that they are practically flat right down to the chines.

In this way the construction has probably been considerably simplified, apparently without any adverse effects as regards resistance. On each side of the forward portion of the hull there is a narrow footboard enabling the crew to pass from the various cockpits up to the engines, and to walk forward for the purposes of mooring the machine, handlines being provided to enable the crew to hold on in a rough sea.

Attention should be called to the special launching trolley by which the machine is handled. This trolley has large rubber-tyred wheels, steerable in pairs, and greatly facilitates the handling of the machine on the slipway.

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TEACHING THE YOUNG IDEA

Aviation Lectures and Flights for Public Schools

AN extremely original, and, we think, commendable, scheme for increasing the general interest in aviation—and consequently creating a larger realisation as to its national importance and far-reaching possibilities—has just been launched, thanks, in the first place, to the efforts of Maj. Victor Stammers and Maj. H. Hemming, the managing director of the Aircraft Operating Company, and, secondly, to the offer of practical support from Mr. Alan Butler, its chairman.

While efforts to educate the public in matters aviatic have been made in the past, and are still being made spasmodically, it cannot be said that the results are perceptible to any marked degree—competition for entrance to the R.A.F. is comparatively small, private flying practically non-existent, and but moderate use is made of the Air Transport services. To the average man-in-the-street aviation still appears to be a pursuit of adventure and great danger, etc. Now, such a state of affairs is most undesirable, and it is with the object of helping to set matters aright that Maj. Stammers, through the Air League of the British Empire, has submitted to the Air Ministry the scheme referred to above.

Briefly, the scheme is to institute a propaganda campaign on aviation throughout the public schools of Great Britain. It is true that lectures on the subject of aeronautics have been given on many occasions before now, but it is Maj. Stammers' opinion that these have, for various reasons, created insufficient, or only temporary, interest. It is held by Maj. Stammers however, that if the boys were actually flown as passengers—in addition to being " lectured "—the interest of the majority of the boys would be held more firmly as regards aviation than, perhaps, any other subjects upon which lectures have been provided.

It is submitted that it is exactly this interest which is required at the moment; it would mean that the foundation would have been laid for a public who were unprejudiced and in a position to fairly consider the developments which are bound to come to aviation, civil or military.

Therefore, it is proposed to send a pilot-lecturer and a suitable machine, together with the necessary ground staff on a tour of our public schools. We understand that the machine chosen for this scheme is a modified D.H. " Moth "—which is the standard type employed by the Light Aeroplane Flying Clubs—as this is considered to be particularly suitable for this kind of work.

In brief, the policy of the undertaking would be as follows:—

(1) To give a series of three or four lectures at each school within a short period of, say, a fortnight, embracing the following subjects: (*a*) Elementary theory of flight; (*b*) The Aeroplane; Construction—Its maintenance—Its equipment—Its possibilities—Its limitations; (*c*) Service Flying in War and Peace—Naval and Military; (*d*) Civil Aviation; Air Transport—Survey and Photographic Work—Advertising—Private flying and Racing; (*e*) Piloting and Observing.

(2) Immediately following the course of lectures, a course of practical flying, each boy being taken up as a passenger under the most favourable conditions for a short flight.

By this method, it is suggested, the boy's interest would be stimulated as he was led, stage by stage, with his mind in a state of keenness to the most interesting part of the course. The attraction of the latter stage would create his interest in the former stage.

Regarding the effect of such a scheme on the parties concerned, *i.e.*, (1) The boy's parents; (2) The headmasters of the schools; (3) The boys themselves; (4) The R.A.F.; (5) Civil Aviation; (6) The Air League; and (7) The Commercial undertaking responsible for propaganda. Of these, (1) and (2) are undoubtedly the most important. In the case of the former, perhaps the most difficult of all, we have the old prejudice to overcome. Of course, the success or failure of the whole scheme depends upon obtaining the consent of the parents. This, it is thought, can only be obtained by persuasion, and by the sympathy and co-operation of the headmasters as a whole. Both parents and headmasters are, we understand, to be approached on the subject, and asked to fall in with the scheme. Major Stammers states if 5–10 per cent. of the applications were approved, this would be considered as satisfactory for the start—and once started, the boys themselves would probably bring further pressure to bear and increase this figure!

To resume with the other considerations; The boys (No. 3) will, without doubt, be almost unanimously keen on the scheme. As regards Nos. 4, 5 and 6—the R.A.F., Civil Aviation and the Air League—the advantages gained by these through the scheme are obvious, while as to No. 7, Major Stammers says that if the idea is favourably received and the work carried out efficiently, it should be possible to make it profitable—if not at once, at a later stage. In this connection, it is hoped to get the assistance of the Air Ministry during the early stages.

As regards the practical working of this scheme, there are, of course, a number of points to be considered, but at this stage, it is hardly necessary for us to go into these. We may say, however, that they have been thoroughly investigated by the organisers with the object in view of making the scheme efficient and successful—special attention having been devoted to the question of the safety and care of the boys.

Our readers will, we think, join us in hoping the scheme will meet with every success, and we await further developments with interest.

The Royal Aero Club of the United Kingdom

OFFICIAL NOTICES TO MEMBERS

Monthly House Dinner

THE next Monthly House Dinner will be held at the Royal Aero Club, on Wednesday, December 16, 1925, at 7.30 p.m.

The subject for discussion will be "Civil Aviation" and the debate will be opened by Air Vice-Marshal Sir Sefton Brancker, K.C.B. The Duke of Sutherland, the Chairman of the Club, will preside.

The number will be limited to 60 and seats will be allotted in order of application.

Apply Secretary, Royal Aero Club.

Offices: THE ROYAL AERO CLUB,
3, CLIFFORD STREET, LONDON, W. 1.
H. E. PERRIN, Secretary

"AMERICAN AVIATION"

R.Ae.C. First Monthly House Dinner a Great Success

As we ventured to forecast in our Editorial Comment last week, November 26 did prove a red letter day in the history of the Royal Aero Club. The first of the Monthly House Dinners was a very great success indeed. It was well attended, the speeches delivered were among the brightest ever heard, at an aviation gathering, and the general tone was just exactly what it should be. If subsequent House Dinners maintain the very high standard set last week, we feel quite certain that a very great deal of good will be done, and in addition to being amusing, these evenings will prove highly instructive. On Thursday of last week His Grace the Duke of Sutherland, Chairman of the Royal Aero Club, presided, and after the loyal toast asked Mr. C. R. Fairey to open the discussion with an address on "American Aviation."

Mr. Fairey said he wished to make it clear from the start that he did not in any way pose as an authority on American aviation, which was a very large subject indeed. He would confine himself to giving a few impressions gathered on his recent visits to the United States, and to a brief outline of the events which had led up to the British defeat in the Schneider Cup Race. Considering impressions, Mr. Fairey said America was a country in which one could gather any impression one went to seek. Religious enthusiasts went to the United States and came back with the impression that America was a very devout nation. Those in favour of prohibition went there and came back filled with enthusiasm at the manner in which prohibition worked there. And so on. One could go there "in blinkers," determined to bring back the preconceived opinions one cherished when leaving these shores, or one could go there with one's eyes wide open, intent on learning as much as possible.

As a result of his visits, Mr. Fairey had formed certain very definite impressions of American aviation, which had made him realise that they had a few facts to face, and that instead of adopting an ostrich attitude it was necessary to face these facts as they were. They all remembered that during the last few years America had captured most of the notable world's records, and he recalled that in addition the Americans had been the first to make the flight around the world, while quite recently they had won a decisive victory in the seaplane race for the Schneider Trophy. As a result of their racing experience they had developed the scout type of machine to a point where it was superior to any other.

Mr. Fairey then recalled briefly the post-war history of air racing, pointing out how, during the first years after the war, nearly all records were held by France, and how the very slow increase in top speeds (about 212 m.p.h. by 1921, coupled with a landing speed of probably over 100 m.p.h.) led to the impression being formed that they were beginning to approach the limit in top speed, the increase of one year's speed over that of the previous year becoming gradually smaller and smaller. About this time stories began to come across from America recording phenomenal speeds. At first these stories were received with incredulity. He himself was sceptical. In Europe the position was that French and British aircraft designers were limited by the large cross-sectional area of their fuselages, by projections of various kinds, by exposed radiators and by wooden propellers, which had about reached their limit as regards tip speeds. The old form of construction, with two spars and fabric covering, was still employed for the wings, and some difficulty was experienced with the fabric at the speeds then being attained.

Then arrived in this country, in 1923, the American Schneider Cup machines, which, as they all remembered, the Americans piloted to victory. He had been among those privileged to examine the American machines and engines at Cowes, and very quickly realised that here new brains had been at work. The exposed radiators disappeared and had been replaced by wing surface radiators. The old wooden propellers, with their maximum efficiency of 74 per cent. or so, had given way to all-metal propellers of thin section, running at tip speeds hitherto considered impossible and giving efficiencies in excess of 80 per cent. The wings showed multi-spar construction, and were covered with wood instead of fabric, and had safety factors round about 12, without any accompanying extra structure weight, as compared with factors of 4 or so for European racing machines of that time. The Curtiss D.12 engines were of narrow Vee form, and enabled the fuselage cross-section to be reduced to the minimum which would accommodate the pilot and the fuel.

From 1923 onwards the story of speed, Mr. Fairey said, moved to America. New world's speed records were set up, and whereas previously the increases had become smaller year by year, when the Americans began to attack world's records, the "bites" taken each year got larger and larger, showing that so far from the speed limit being approached, the slope of the curve did not commence to flatten out. When it was remembered that, so far from these great increases in top speed being accompanied by an increase in landing speed, they were attained with a *lower* landing speed, in other words, that they represented a vast increase in *speed-range*, it would be realised what a technical achievement had been accomplished. The limit on landing speed imposed by the regulations for the Pulitzer race was 75 m.p.h., and if a machine exceeded that figure by a very low margin (Mr. Fairey was not quite certain but thought it was by but two miles per hour) it was automatically disqualified from taking part in the Pulitzer. The designer of the Curtiss machines, Mr. Gilmore, had informed Mr. Fairey that with the present landing speed limit he (Mr. Gilmore) saw no reason why top speeds of 285 m.p.h. should not be reached, while if the limit on landing speed were removed, at least 300 m.p.h. should be attained. From what he knew of the machines, Mr. Fairey saw no reason to doubt the accuracy of Mr. Gilmore's statement.

If one examined the means whereby these great achievements were attained, it was found, Mr. Fairey stated, that there had been no revolutionary change in design. It was all a matter of recognising their old friend (or enemy) KSV^2. It was known that the resistance of the air varied as a constant, the value of which did not matter for the moment, as the surface, and as the square of the velocity. This was a natural law, and when man pitted himself against nature, his first aim was to discover the natural law governing the particular object he had in view. Having discovered that law, he tried to obey it, and the degree of his success was a measure of his obedience. It came down to this, then, that the reason for the present American superiority was that American designers had recognised this fundamental law, while European designers had not, or had failed to heed it.

Turning to the British Schneider Cup machines, Mr. Fairey paid a tribute to the Napier engine, of whose outstanding qualities we British might be justly proud. In design, in construction, in quality of workmanship and in running, the engine was excellent. There was just the one fact of the

fundamental law of frontal area that had been lost sight of. The Supermarine machine was an excellent machine. It was of clean design and was a most admirable machine in every way, but it erred in the *one* respect of fuselage area. These were the facts, and Mr. Fairey thought they ought to be faced as such.

Concerning the Schneider Cup Race, or rather the events immediately preceding it, as he had not been present at the actual race, he thought it might be of interest if he gave his impressions, gathered as an ordinary spectator. At first it had been intended that the New York Yacht Club should organise the Schneider Cup Race, but Baltimore claimed priority as having had the organisation the previous year when, owing to absence of foreign entries, the Americans had declared "no race." The Baltimore claim was admitted, and the Flying Club of that city was entrusted with the organisation for 1925. There was no denying the fact that the arrangements made for the accommodation of the British team were inadequate. When they arrived there were no hangars, no slipway, in fact nothing. This caused delay. Then the weather during the days preceding the race was the worst experienced there for many years, a further cause of delay. The accommodation for the mechanics was totally inadequate, but it should be stated that Capt. Wilson did all he possibly could to secure better conditions. In fact, to drop into the vernacular, Captain Wilson "raised Cain." Altogether, those responsible for the management of the British Schneider Cup team did all they possibly could, and in this connection he would specially mention Captain Wilson, Captain of the team, Col. Darby, and Major Buchanan, who did everything possible under the conditions.

Concerning the question of practising for the race, Mr. Fairey said he would like to correct a misapprehension that the American pilots had had a lot of practice. They had not, in point of fact, for the very good reason that there were no really fast machines for them to practise on. The actual flying on Schneider Cup machines, prior to the seaworthiness tests, was limited to two flights of about half-an-hour each, one, Mr. Fairey thought, by Ofstie and one by another pilot. Actually the machines were not finished in time to allow of any previous flying on them.

On the question of piloting, Mr. Fairey said he had it from American observers, he himself having been obliged to leave for England before the actual race on account of the postponement of the race, that in their opinion the British pilots flew their machines as well as the Americans flew theirs, and that Captain Broad flew a better course than did anyone else, with the exception of Lieut. Doolittle. Personally, Mr. Fairey would be prepared to back a British pilot on one of the American machines against an American pilot on a similar machine. The piloting of the British machines could not be blamed for the defeat, and what had to be learned was the importance of reduction in fuselage area. The Americans had beaten Great Britain in speed racing because they had devoted themselves to speed work. Unless Great Britain took the lesson to heart, the Americans would do the same in other respects, and the warning ought to be heeded. In this connection the subject of research might be mentioned, and Mr. Fairey thought that there was this very great difference between British and American research that whereas the former was along scattered and somewhat academic channels, seemingly arriving nowhere in particular, American research was focussed on definite problems. The position and organisation of British research should be considered.

In much lighter vein, but none the less important for that, Mr. Fairey turned to the subject of private flying. At the recent meeting at Mitchell Field, New York, at least 100 privately-owned aeroplanes arrived at the meeting, and from conversation with a number of private owners, Mr. Fairey had formed the opinion that quite a large number of machines were not only privately owned, but that in very many cases the owners had already come to regard their machines as quite ordinary reliable means of transport for business purposes. He was speaking about really private flying, as distinct from organised air lines, such as Imperial Airways in this country and the coast-to-coast air mail in America. It was found that there were a great number of private machines in use, and if one talked to an American about their private machines being under little control (as regards legislation, not aerodynamic control), the American did not hang his head. He replied, "Yes, we have very little control over our civilian aviation, but we have a . . . of a lot of flying." In Great Britain, on the other hand, they had plenty of control, but precious little flying. Mr. Fairey then proceeded to outline briefly the unhappy position of a man who had been misguided enough to obtain an aeroplane whereon to take his wife or his "best girl" for a flight to Brighton, for instance, for the day or the week-end as the case might be. First of all he had to obtain from the Air Ministry a Certificate of Airworthiness, showing that his machine was fit for heroes to fly in. Then he himself had to obtain an "A" licence as a pilot, to satisfy the authorities that he was capable of handling his machine. That was, unless he was prepared to remain within three miles of an aerodrome. For instance, a private owner-pilot was within his rights and within the law if, starting off from Croydon, he crashed on one of the municipal trams in Croydon. But if he crashed on a tram at Dorking, for example, he was breaking the law. Reverting to the Brighton-bound week-ender, what happened when the unfortunate man wanted to return? He could not legally do so until a ground engineer could get to Brighton to certify that the machine was safe. Comparing the two systems, was one not obliged to arrive at the conclusion that flying was better than control?

Before concluding, Mr. Fairey desired to refer briefly to an impression that seemed to be current in this country, to the effect that the rapid American progress had been the result of Government assistance. Actually this was not so, and there had been very little "spoon feeding." The progress made was due largely to one private company, the Curtiss Company. When that company was taken over by Mr. Keyes, he deliberately set himself the policy to win world's records, believing this to be the best way to establish good will and a world reputation. That policy had been strictly adhered to, with what results they all knew.

Mr. F. Handley Page, who very soon proved to be in his very best form, caused much hilarity by saying that he arose with some diffidence, placed as he was, like a rose between two thorns, having on his left Mr. H. T. Vane, of the Napier Company, and on his right Mr. C. R. Fairey, "of the Curtiss Company." In fact, he might say he felt very much like a carburettor placed between two banks of cylinders, which he understood was a most unhappy position, and one that might cause a fire. (Laughter.) Perhaps the situation might be saved by the fact that in this country we had methods of cooling which, he understood, were denied the Americans. Reference had been made to the British system of supervision of flying. He was informed that it was regarded as a very important step forward when, at the last R.A.F. Display, His Majesty the King was able to give instructions direct to the squadrons by wireless, but what happened was that the whole scheme was spoiled by the very thing they were complaining of—"interference." In the presence of the Under-Secretary of State for Air, he did not intend to say too much, but many wonderful machines, many magnificent flowers of the aircraft designers' brain, were doomed to bloom in darkness. At any rate, that was so at Cricklewood. (Laughter.)

While agreeing with Mr. Fairey that the Americans had produced, of recent years, some wonderful machines, it should, he thought, be remembered that when America came into the war as our associates, and very glad we were to see them come in, this country had been struggling along as best it might, feeling its way in the matter of aircraft production. All the first fruits of British aviation were handed to America in the form of the complete designs of the best British machines in existence, and the Americans thus had the advantage of Britain's experience up to that time. The financial returns for the great number of British machines built in America were relatively small, certainly in the case of the machines designed by his company they were wholly inadequate. Mr. Fairey had laid great stress on the importance of the reduction of frontal area. It did not seem to him that a very small difference in frontal area was going to make a great deal of difference; what was much more important was to reduce the obtuse resistance of some people. He refused to believe that we in this country were unable to produce machines as fast as the American. We merely had not set our minds on the problem. What was required was more co-operation of effort.

There were, Mr. Handley Page said, two ways in which this country could regain its prestige. One was by attacking world's records. There was no publicity like world's records, and he humorously asked the Air Ministry to help by letting such machines as were capable of putting up new records be regarded as "civilian" for the purpose. If firms attempted to use the machines for such purposes without the consent of the Air Ministry they would soon be spending a period of enforced idleness. Civil aviation afforded another opportunity of showing the world what Great Britain could do, and so of enhancing the reputation of British aviation. If we could establish and prove practicable a regular air service between London and Australia, it would be a far greater conquest than the Schneider Cup.

Sir Philip Sassoon, Under-Secretary of State for Air, said

he thought the Royal Aero Club was to be congratulated upon its first monthly house dinner, and expressed the hope that subsequent dinners would prove, not more successful—that would be impossible—but as successful as the first one. He had listened with great interest to Mr. Fairey, and had to admit that he agreed with everything Mr. Fairey had said. He then listened with equal interest to Mr. Handley Page, and he must say he also agreed with him. He could not help realising what a loss it was to the House of Commons that these two gentlemen had become aircraft constructors. Concerning the present temporary eclipse of Great Britain in air racing, he would point out that one fact which might have something to do with the matter was that our defence problem was a good deal more serious and pressing than was that of America. Still, we ought to do better, and he hoped that at the next Schneider Cup Race Great Britain would be able to put up a better show. With reference to the subject of official interference in the matter of private flying, he hoped it would be found possible for the Air Ministry to relax to a not inconsiderable extent some of the present restrictions. Sir Philip then apologised for having to leave, his presence being required in the House.

Col. Bristow said that in a very long connection with aviation he did not remember having listened to a speech as fine as that just made by Mr. Fairey. It was temperate and restrained, and almost judicial in its summing up of points. Concerning the present position of air racing in this country, he would point out that we had not had a series of races here leading up to the Schneider as had America. That accounted in part for the difference. He asked his audience to look upon American aviation and British aviation as two shops side by side. One shop, the British, was paying heavy taxes, while at the same time paying out money to the other shop. It was scarcely to be expected that it could devote so much time and money to the production of racing aircraft.

Although agreeing with much that Mr. Fairey had said, he could not believe that a matter of a few square inches in frontal area could make all the difference in speed between the American and the British Schneider Cup racers. Rather was it a question of a number of other items. On the engine question he would point out that, whereas 100 per cent. of the British engines finished the race, only $33\frac{1}{3}$ per cent. of the American engines finished. He could not accept Mr. Fairey's statement as to the limit of 75 m.p.h. on the landing speeds of the Pulitzer racers. If the figure was actually adhered to, how was it that the pilots were provided with split fuselages so as to enable them to descend by parachute should their engines fail ?—75 m.p.h. was not such a terrific speed that this should be necessary. He agreed that in the matter of research progress in this country was not equal to that of a semi-paralysed tortoise, and required a change in planning. He thought it was incorrect to regard the single-seater fighter as the only machine which was required to be fast. The tendency would be for fast machines in all classes. Finally, concerning Mr. Fairey's "Mormon friend," was Mr. Fairey not incorrect in stating that he would require an "A" licence ? Surely under the circumstances he would have to have a "B" licence. (Laughter.)

Major Oliver Stewart was rather doubtful as to the importance attached by Mr. Fairey to the subject of frontal area. If it was, as Mr. Fairey seemed to imply, impossible to attain high speeds with machines fitted with the Napier engine, how was it that the present world's speed record of 280 m.p.h. had been established by the Bernard "Ferbois" monoplane, which was fitted with a Hispano-Suiza engine of the "broad-arrow" type ? Also the world's altitude record was held by a machine fitted with a Hispano-Suiza of, he thought, the same type. (Actually the altitude record established by the Gourdou-Lesseure monoplane was attained with a 300 h.p. V-type Hispano with supercharger.—ED.)

Major Buchanan wished to thank Mr. Fairey for the nice things he had said about him and others in connection with the management of the British Schneider Cup team. On technical questions, however, he could not agree with Mr. Fairey. Thus in the matter of the various types of machines, although the Americans had certainly produced some wonderful racers, he could not agree that in other types they were ahead of this country. On the question of multi-spar construction mentioned by Mr. Fairey, he failed to see how a multi-spar wing could give lower structure weight. On the contrary, one would expect it to come out heavier.

Col. Darby said he was somewhat disappointed that the discussion had departed from the subject of "American Aviation" and had turned almost exclusively to the Schneider Cup race. Had it dealt with American aviation and British aviation in general, as might have been expected from the title of Mr. Fairey's address, he thought it would be found that in aviation generally Great Britain could hold her own. Concerning private flying, it should be remembered that geographical conditions in the United States were very different from our own, the long distances rather tending to encourage private flying. He thought a certain amount of control was necessary in this country.

Mr. Fairey, in replying to the various points raised, pointed out that one very big advantage of air racing in America was that it had stimulated public interest, and thus tended to make it easier to obtain money for aviation. With reference to Col. Bristow's doubt as to the 75 m.p.h. landing speed in Pulitzer, there was no doubt at all that the figure was to all intents and purposes exact. It was stipulated that scale models be tested in a wind tunnel, and if the lift developed corresponded to a full-size speed of more than about 1 m.p.h. more than the 75 m.p.h., the machine was mulcted a certain amount in its top speed. If the figure was more than 2 m.p.h. in excess of the 75 m.p.h. the machine automatically was disqualified from taking part in the race. As regards Col. Bristow's reference to the "split" fuselages, actually that was a myth. What had given rise to the legend was that one pilot was built on rather large proportions, and the cockpit coaming had to be cut away slightly to allow him to get in, aluminium plates being put on afterwards. The use of the parachute was regular service routine, and landing a machine at even 75 m.p.h. on bad ground was a very risky procedure.

Major Stewart had raised the point of the French "Ferbois" world's speed record holder. That machine was a very different proposition. Its landing speed was probably more than 100 m.p.h., while the Americans had a low landing speed. Their achievement was the greater because of the large *speed range*. If one liked to put up the landing speed the top speed could, of course, be increased. The American machines had done 249 m.p.h. around a triangular course, so that they would do at least 265 on a straight course. Turning to the points raised by Major Buchanan, as an aircraft constructor he (Mr. Fairey) was, of course, privileged to disagree with Major Buchanan. It was perfectly true that the weight per square foot of the Curtiss wings was greater, but the safety factors were much higher—12 to 14— and the unit lift higher, and on that basis the wings could justly be held to be lighter. As regards the statement that the American scouts were better than ours, this was merely a statement of facts, not of opinion. Their top speed was about 170 m.p.h., and they had a ceiling of 22,000 ft., carrying approximately the same military load as ours. Nobody who had seen them stunted could deny that the controllability was at least equal to our best.

Mr. Fairey said he had heard it suggested that next year service pilots should be allowed to fly in the Schneider Cup Race. That was an admirable idea, but he hoped that this would not mean the exclusion of civilian pilots, as that would be doing them a very great injustice.

There seemed to be a general impression that America had spent a great deal of money to attain these results in high-performance machines. Actually that was a mistaken impression. American appropriations were no larger than ours, and as to the actual Schneider Cup machines, he thought it had not cost the United States any more to attain the speeds they had reached than it had cost us to reach our more modest speed figures. Mr. Fairey concluded by repeating that we should face facts as they were. What was required more than anything was a change of attitude.

Col. Frank McClean proposed a vote of thanks to His Grace the Duke of Sutherland for conducting such an interesting discussion. He pointed out that these discussions did not in any way trespass upon the ground covered by the Royal Aeronautical Society, and expressed the hope that at the next house dinner the subject might deal with "lighter-than-air" problems.

The Duke of Sutherland, Chairman of the Royal Aero Club, said the dinner had, he thought, been a most interesting one. He recalled that the Club had been founded, as the first aero club in the world, by the late Charles Rolls, and that fact gave them a prestige to live up to. The monthly house dinners would help a great deal towards that end.

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U.S. Aeroplane Disaster

OWING to the simultaneous stoppage of both engines of a Martin Comber, when cruising off the rocky coast of Oahu on November 23, the machine crashed into the sea. Two of the crew were carried under the water and were drowned. The two survivors swam ashore, one landing safely, while the other lost consciousness but was rescued by his companion.

FLIGHT

LIGHT 'PLANE CLUB DOINGS

London Aeroplane Club

FLYING during the week was restricted to four days, and the total flying time was 24 hrs. 35 mins.

Owing to the illness of Mr. G. T. Witcombe, practically all the flying instruction was given by Mr. F. G. M. Sparks.

The following members had flying instruction :—J. S. M. Michie, Miss Salusbury, A. Southgate, G. N. Howe, J. Barros, Mrs. Atkey, D. Kittell, R. Malcolm, R. V. Banks, N. Jones, W. Hay, A. R. Ogston, C. E. B. Moss, N. J. Hulbert, Commandant Allen, Miss Taggart, A. Kennedy, G. Vlasto, R. C. Presland, Major Beaumont, G. W. Quirk, Col. Turner, D. P. H. Essler, O. J. Tapper, S. C. Richards, E. S. Brough, W. E. P. Johnson, V. H. Doree, C. E. Murrell, B. Tucker, G. H. Saffrey.

Solo flying was carried out by Squadron-Leader M. E. A. Wright (30 mins.), P. G. Lucas (1 hr.), Mrs. Eliott-Lynn (2 hrs.), G. H. Craig (1 hr.), G. N. Warwick (1 hr.), W. Roche Kelly (30 mins.), N. J. Hulbert (30 mins.), A Kennedy (30 mins.).

During the Christmas Holiday, flying will be suspended from the Wednesday, December 23, till Thursday, December 29.

The Lancashire Aero Club

THE weather has been bad all through the week, fog, wind, and further fog. Flying took place only on Wednesday, Friday, Saturday and Sunday. Hours flown 3 hrs. 10 mins., dual, 30 mins. solo. Tests occupied 35 mins., total hours flown 4 hrs. 15 mins.

The following had instruction from Mr. Cantrill. A. Goodyear, (25 mins.); C. A. S. Parker, (70 mins.); A. Colley, (10 mins.). Mr. Scholes gave dual to S. Crabtree, (20 mins.); H. Stern, (50 mins.); B. Tummers, (15 mins.). Solo flights by M. Lacayo, (10 mins.), A Goodfellow, (20 mins.).

There will be a lecture at the Club's Headquarters in Manchester on December 8 at 7.30 p.m. Mr. Cantrill will speak on "Practical Flying," Mr. Scholes on "Navigation," and Mr. Leeming on "'A' Licences." Mr. Cantrill and Mr. Scholes are the Club Instructors, Mr. Leeming is the official observer for the Royal Aero Club for Pilot's Certificates. Members are invited to bring friends.

An unfavourable impression may be created by the shorter hours which are flown by this Club compared with London and Newcastle. There are two reasons, first the Aerodrome is 16 miles from Manchester and members find that these short afternoons they have to leave Manchester at lunch time to get any flying before dark. The second reason is that the Club, unlike the others, has not a permanent Instructor always in attendance, and members can not drop down on chance but have to make arrangements and find out if an Instructor will be there. The Club's two unpaid Instructors are doing excellent work and are carrying the Club on until the Spring, when it is intended to get a permanent paid Instructor. The Committee feel that if they can save money until Spring and the light evenings come it will give the Finance Committee some slight chance of making ends meet. In the Spring, with five machines, it is hoped to put in a lot of flying and to increase the membership. In the meantime the Club is proceeding slowly, and keeping an eye on the overhead charges, also Manchester is noted for its exceptionally bad weather—rain and fog.

The Newcastle upon-Tyne Aero Club.

REPORT for week ending, November 29, 1925 :—

Total times flown—L.X., 4 hrs. 12 mins., L.Y., 7 hrs. 18 mins. = 11½ hrs. The following members have had instruction with Major Packman during the week.—Mr. A. E. George (50 mins.), W. M. MacKay (32 mins.), J. C. Lawrence (15 mins.) G. H. Twine (30 mins.), R. N. Thompson (65 mins.), A. Bell (15 mins.), L. de Loriol (2 hours).

On Thursday, Mr. Heppell flew solo for 22 mins.

Mr. W. M. MacKay made his first sole flight on Monday, 23rd, for 15 mins., also 22 mins. on Thursday.

Mr. Stobie carried out the test for his "A" Licence on Monday, flying for 2 hrs. 13 mins. He stated that it was "mighty cold at 6,000," and so it must have been. On Tuesday, he made some forced landings, under Major Packman's instruction, in a small field.

Major Packman carried the following as passengers during the week :—Miss Pringle, Miss Bruce and Miss Oxley.

Mr. Baxter Ellis flew for 45 mins. on Thursday with Mrs. Ellis and Mrs. Waller as passengers (2 flights). Mr. Ellis has also been taking Cinema Photographs both from the air and of a machine in flight piloted by Major Packman.

No flying took place on Wednesday owing to a severe snow storm, since when, it has been necessary to "dig the machine out of the hangar," as it is described by Major Packman. There have been drifts of about 7 ft. in front of the hangar on some days, and on Thursday, Friday, Saturday and Sunday, flying has only been possible during short intervals between falls of snow. Not a minute has been lost throughout the week, however.

Mr. Heppell took photographs of some of the flying, as well as Mr. Ellis's cinema photographs, and it is hoped that if they are satisfactory some may be published.

Major Packman is taking instruction in the local dialect. This course has been found necessary, as in dual flying, the telephones do not appear able to interpret the speech which passes along the tubes from and to Pilot and "Tyneside" pupils. It is understood that he is making satisfactory progress under the tuition of Messrs. J. Bell and Stobie.

The following took place between Major Packman and a prospective candidate for a "B" Licence.

Q. "What is 'a bearing'?"

A. "A place where they keep bears."

This shows the necessity of Major Packman learning the language.

In response to requests for photographs for the decoration of the Club house, some excellent pictures have been received from Messrs. K.L.M., and a number of postcards from Imperial Airways Limited, for which the Club is very grateful.

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Queen Alexandra : Air Ministry Message of Condolence

THE Air Ministry announces that the following letters have passed on the occasion of the death of Her Majesty Queen Alexandra :—

Air Ministry, Kingsway, W.C.2,
November 23, 1925.

DEAR LORD STAMFORDHAM,—I am directed by the Secretary of State for Air, on behalf of the Air Council, and in the name of the Royal Air Force, to ask that you will be good enough to submit to the King, with their humble duty, an assurance of their deep and respectful sympathy with His Majesty on the bereavement he has suffered by the death of Her Majesty Queen Alexandra.—Yours very truly,

W. F. NICHOLSON
(Secretary of the Air Ministry).

Buckingham Palace,
November 24, 1925.

DEAR SIR WALTER NICHOLSON,—Your letter of the 23rd instant has been laid before the King : and I am desired to express His Majesty's sincere thanks for the kind words of sympathy in his great sorrow which you have conveyed on behalf of the Air Council and of the Royal Air Force.—Yours very truly,

STAMFORDHAM.

New U.S. Air Mail Routes

THE following firms have been awarded contracts for new air mail services by the U.S. Postmaster-General :—Colonial Air Lines of Naugatuck, Conn. (Boston to New York via Hartford); Robertson Aircraft, Inc., St. Louis (Chicago to St. Louis via Springfield); National Air Transport, Inc.' Chicago (Chicago to Dallas and Fort Worth); Western Air Express, Inc., Los Angeles (Salt Lake City to Los Angeles); Walter T. Varney, of San Francisco (Elko to Pasco).

London-Cape Town Flight

MR. ALAN COBHAM, who, with Mr. Elliott and Mr. Emmott, is flying from London to Cape Town on a D.H. 50J biplane (Siddeley "Jaguar"), has slightly modified his plans, and has prolonged his stay at Athens until some time this week. His reason for doing so is in order that he may study the possibilities of Mediterranean air routes and investigate several inquiries on this subject he has received while at Athens. In the meanwhile Mr. Elliott is carrying out certain modifications to their mount.

R.A.F. Flying Accidents

THE Air Ministry regrets to announce that as a result of an accident at Leysdown, near Eastchurch, to a Grebe machine of the Armament and Gunnery School, Eastchurch, on November 20, Pilot-Officer Cecil William Montague Smith, the pilot and sole occupant of the aircraft, was killed.

As a result of an accident at Hinaidi, Iraq, to a D.H.9.A. of No. 30 Squadron Hinaidi on November 23, Flying Officer Joseph Albert Moore, the pilot of the aircraft, and No. 354797 A.C.1 Arthur Algernon Rickaby were killed.

As a result of an accident near Upavon Aerodrome, Marlborough, Wiltshire, to a Sopwith Snipe of No. 3 Squadron, Upavon, on November 26, 1925, Flight-Lieutenant James Anderson Slater, M.C., D.F.C., and Pilot Officer William John Reginald Early were killed.

THE COPPA D'ITALIA

THE international competition for touring aeroplanes, known as the Coppa d'Italia, was held in Rome from November 12 to 19. It was not an international event in name only, for five nations were represented. These were Belgium, Czecho-Slovakia, France, Germany, and Italy. Of these Czecho-Slovakia carried off the "Coppa," or cup.

The Coppa d'Italia was a competition for touring aeroplanes with a single engine of 40-90 h.p., for a first prize of 150,000 lire and a cup valued at 30,000 lire. It was flown under the rules of the F.A.I., and in honour of the Marquis di Pinedo, who recently completed his splendid flight from Rome to Tokyo and back. The competing machines had to carry a useful load (pilot and passenger) up to 175 kgs. (385 lbs.) exclusive of petrol and oil.

A qualification for participation in the competition was that the machines had to have a stalling speed not exceeding 70 kms.p.h. (43·5 m.p.h.), and a top speed of not less than 100 kms.p.h. (62·2 m.p.h.). Machines had to be fitted with the usual instruments, and in the case of water-cooled engines a radiator thermometer had to be included.

The competition was held over a triangular course of just over 50 kms. (31 miles), which had to be covered six times, a total distance of 325 kms. (201·5 miles). During the first lap competitors had to climb to an altitude of 1,000 m. (3,280 ft.) per registering barograph, while the second circuit had to be commenced at an altitude of 100 m. (328 ft.)

Competitors were classified according to the following formula :—

$$Vm \times \frac{175}{Ct} \times \frac{V\ max.}{V\ min.} = X,$$

where Vm equals the average speed (in kms.p.h.), arrived at by dividing the total distance covered in the competition (in kms.) by the total time taken. Ct is the weight of fuel and oil consumed during the competition, while 175 represents the useful load (in kgs.). V max. and V min. are the top and low speeds respectively (in kms.p.h.), as determined during the eliminating tests.

It was originally intended to hold the eliminating trials on November 12, but owing to unfavourable weather conditions these had to be postponed to the following day. The main contest, over the full course, was held on November 15 (Sunday), and a large number of spectators turned up to witness the proceedings, among those present being King Victor Emanuel, the Premier Sig. Mussolini, and, of course, the Marquis de Pinedo, in addition to many other notables.

The first to start was the pilot Bacula (Italy), on the Macchi M20 (50 h.p. Anzani), the others leaving at one-minute intervals. The last away were Bernardi (Italy) on another Macchi M20 (but fitted with a 70 h.p. Lawrence engine), and Fritsch (Czechoslovakia), on the Avia B.H.11 (60 h.p. Walter), and Jira (Czechoslovakia) on the Avia B.H.9 (60 h.p. Walter).

The Avia B.H.11, fitted with a 60-h.p. Walter engine, which was placed first in the Coppa d'Italia, which took place in Rome, November 12-19.

On the first lap the Avias passed five of their rivals, while Udet (Germany), who was the third man away, on the Udet U.12 (75 h.p. Siemens) gained on Bacula (Macchi). Bit by bit the Avias and Bernardi's Macchi gained on Udet's Udet, until on the sixth and last lap matters became really exciting. Jira passed his compatriot Fritsch, and gained first place, the latter being second and Bernardi third. The remainder were placed in the following order :—Udet, Bacula, Passaleva (Italy) on a Savoia 56 amphibian (70 h.p. Anzani), Gauron (France) on a Caudron C.109 (40 h.p. Salmson), Van Opstal (Belgium), on a Cambier-Guldentops (60 h.p. Anzani).

The following day, Monday, November 16, was devoted to the petrol and oil consumption tests, in which Fritsch and his Avia B.H. 11 created a very favourable impression with a fuel-weight of only 34½ kgs. (76 lbs.). During the three following days tests for maximum and minimum speed were carried out.

In the final classification, Fritsch came in well ahead, with 1,615 points as against Bernardi's (placed second), 1,443. The placing of the other competitors, with certain other particulars, will be found set out in the accompanying table.

Official Results and Classification

Final Classification.	Pilot and Nationality.	Machine and Engine.	Over 325 km. Course. Average speed, kms. p.h.	Order.	Total Consumption. Kgs.	Speed. Maximum kms. p.h.	Speed. Minimum kms. p.h.	Points.
1	K. Fritsch (Czechoslovakia)	Avia B.H.11 (60 h.p. Walter)	140·253	2	34·72	154·068	67·520	1,615
2	De Bernardi (Italy)	Macchi M.20 (70 h.p. Lawrence)	139·361	3	41·94	147·749	59·485	1,443
3	Bacula (Italy)	Macchi M.20 (50 h.p. Anzani)	121·200	5	36·25	139·217	58·019	1,412
4	Gauron (France)	Caudron C.109 (40 h.p. Salmson)	111·641	7	29·65	124·429	66·763	1,227
5	Udet (Germany)	Udet U-12 (75 h.p. Siemens)	134·347	4	56·38	147·542	67·980	905
6	Passaleva (Italy)	Savoia 56 amphib. (70 h.p. Anzani)	117·202	6	51·91	126·248	64·058	779
7	Van Opstal (Belgium)	Cambier-Guldentops (60 h.p. Anzani)	104·788	8	45·17	124·587	69·769	724
—	Lieut. Jira (Czechoslovakia)	Avia B.H.9 (60 h.p. Walter)	142·019	1	37·63	146·766	74·642	—

FLIGHT

INSTALLATION PROBLEMS OF RADIAL AIR-COOLED ENGINES

By ROY FEDDEN

AT the Meeting of the Royal Aeronautical Society, held on November 26, the chair was taken by Air Vice-Marshal Sir Sefton Brancker, Director of Civil Aviation, who called upon Mr. Roy Fedden to read his paper on "Installation Problems of Radial Air-Cooled Engines."

Mr. Fedden said it was with certain misgivings he had ventured to present a paper on the "Installation of Radial Air-Cooled Engines," as the subject would appear at first sight to be the province of the aeroplane designer. He submitted, however, that this important subject was a co-operative one and that the engine maker, looking at the difficulties from another aspect, might be able to bring new light to bear on the problems. The air-cooled radial had now, the lecturer said, arrived at a stage in its development where it could compare favourably with the existing types, but he believed that much might yet be done to put the air-cooled radial installation on a better and more standardised basis.

Mountings

Concerning the mounting of radial engines, the present time showed a considerable variation in design. Owing to the wide range of installations required, in types ranging from the single-seater scout to the large-diameter fuselage machine, it was admitted that engine mountings could not be interchangeable, but it was thought that greater standardisation and additional saving in weight of the mounting structure might be obtained by investigating the requirements in some detail. The lecturer then outlined in detail certain requirements from the engine maker's point of view, and gave a table of comparative installation weights, showing the French Henry Potez 25 fitted with four types of water-cooled engine and one type of air-cooled radial. In the case of the latter, the Bristol "Jupiter," the weight per b.h.p. of installation unit in lbs. was 2·0, while the best of the water-cooled showed the figure of 2·74 lbs./h.p.

To provide a mounting strong enough to support the engine without serious deflection under all working conditions, and stiff enough to withstand the torque variations of the engine and the natural periods of the mounting and engine, the aircraft designer required to know the weight of the engine, the centre of gravity of the engine, the torque diagram of the engine and the polar mass moment of inertia of the engine.

Mr. Fedden admitted that in the past engine makers had not been as careful as they should have been in providing all the necessary information. He expressed his indebtedness to Mr. J. D. North, chief engineer and designer to Boulton & Paul, for the method of obtaining the mass moment of inertia.

A slide was shown illustrating how this mass moment of inertia was ascertained in the Bristol shops for the "Jupiter" engine. The engine was suspended with the crankshaft in a vertical plane, propeller end undermost, by means of three wires fixed equidistant from the crankshaft axis, the wires being of equal length and parallel to one another. The engine was levelled by means of adjusting screws in the plate, and then made to oscillate through as small an amplitude as possible, approximately 5 degrees each side of its mean position. The time taken for 50 complete double swings was noted in order to obtain the periodic time. With the weight of the engine and the effective length of suspension known, the polar mass moment of inertia could be calculated.

Where the engine mounting was attached to the fuselage by means of pin joints, these must have sufficient bearing surface, and the lecturer pointed out that some of the earlier mountings were somewhat lacking in this respect. He stated, however, that hollow taper pins with a ground finish would provide a very great increase in bearing surface with a fractional increase in weight. In mountings of this type, suitably designed spherical joints with adjustment for wear provided an excellent refinement. Where the radial engine was spigot mounted, the mounting plate must be true and a good fit to ensure maximum surface contact. A set of drawings were projected showing various mountings for the "Jupiter" engine, some of which were made of Duralumin and others of steel. The swinging type of mounting had not, the lecturer said, been very well received. He realised that it was not as light as the fixed type, but it offered certain advantages. As an example of this type of mounting, a slide was shown of the mounting employed in the Koolhoven F.K. 31.

Cowling

On the subject of cowling on radial air-cooled engines, Mr. Fedden said that the standard type, in which some portion of the air-cooled cylinder head projected, might be divided into two parts, the forward portion or fairing between propeller and engine mounting, and the rear part consisting of panels between the engine mounting proper and the fireproof bulkhead. On the first of a new type, the cowling could often be made up on the spot, but afterwards the form chosen required very careful design, to avoid localised stress and consequent cracking. Mr. Fedden submitted that on a single-row radial it was not imperative that the front portion of the cowling should be immediately detachable, as no portion of the engine inside this fairing required very frequent attention. When considering the rear portion of the cowling, accessibility was of the utmost importance, and the rear panels should be immediately detachable by means of some safety catch which was fool-proof, would not drum, and which did not weaken the panel and cause localised stresses.

Spinners

On the subject of spinners Mr. Fedden said that, appreciating the desire of the aeroplane designer to provide a good entry, he believed that most of the present type of metal spinners, if large enough to be of much value, were a very difficult manufacturing problem and unreliable. On future fast types of machines with air-cooled engines he realised that such spinners might have to be faced, in which case further attention must be given to their design. In the meantime an excellent compromise was provided by the integral wooden type of spinners employed by Mr. Folland in the Gloucestershire machines.

Exhaust Systems

It was quite remarkable, Mr. Fedden said, how difficult the solution of a satisfactory exhaust system had proved, partly because there was a great deal more to solve than was at first realised, and partly because the responsibility was divided. He thought that the most difficult part rested with the engine maker, and it should consequently be recognised as an engine maker's problem. The most suitable form of exhaust system for general use with an air-cooled radial was the ring or segment type, individual cylinders discharging direct into an annular form of collector provided with two main outlets discharging to atmosphere. Among the important requirements were that the system must be of sufficient volume not to cause back pressure, that it must be so designed that there were no sharp bends and that the exhaust gases did not play directly on any portion of the expansion chamber, as either of these conditions was likely to produce localised hot spots. The pipes from individual cylinders leading to the main chamber must be provided with flexible joints to allow for expansion of the cylinder heads. A slide was shown of a satisfactory exhaust system produced for the "Jupiter," which had been tested for over 450 hours in flight without damage to the engine or failure of the exhaust system. Two different types of ring were in production to be used according to the shape of the fuselage. Mr. Fedden stated that with a properly designed exhaust system there was less fire risk than with stub pipes, and from very recent experience gained on water- and air-cooled engines, stated that the safest position for the system was in front of the engine.

Lubrication System

While dealing with the question of lubrication of radial air-cooled engines, reference was made to the location of the main oil tank, from which the oil was drawn by a double-spur gear pump situated near the central axis of the engine. It was not convenient to arrange the oil pump unit in such a low position as was common on water-cooled engines, and the tank must not, therefore, be too low. In the case of the "Jupiter" the pressure pump would operate satisfactorily under all conditions with a good pipe line system with an 18 in. negative head. On the other hand the tank must not be too high, otherwise there was a danger of an oil leakage when the engine was standing. If the head exceed 5 ft. a tap should be fitted between the tank and the pressure pump, and it was then most important that this tap should be interconnected with the petrol cock or switch in order to make it impossible to run the engine with the oil "off." With the rather short pipe lines on radial engine installations it was

very necessary to guard against sharp bends, and it was important that flexible joints should be introduced in the piping, otherwise rigid screwed joints were a source of danger. In all types of modern air-cooled engines it was desirable, in order to ensure passing as much oil as possible through the engine and the bearings generally, that the oil circulation should be the maximum possible. Further, as the relative surface of the crankcase was small and often covered in by cowling, oil-coolers were necessary, and the Bristol Company had developed a series of coolers of various types, according to different installations.

The oil-coolers described by the lecturer had been found to function satisfactorily, but it was thought that there was still more work to be done on this part of the installation.

Carburation

Air-cooled radial engines were, Mr. Fedden said, somewhat more susceptible to changes in temperature, in so much as the air-cooled engine was not at present provided with the temperature control by means of shutters or thermostat standardised on water-cooled engines. He thought this difficulty was to some extent responsible for the statements that early air-cooled engines fell off abnormally in performance at altitude. Considerable improvement had been made in the carburation of air-cooled engines at altitude, but there was still much to be done, and Mr. Fedden expressed the opinion that here again the difficulty had been one of divided responsibility. The Bristol "Jupiter" engine had a combination of exhaust heating to the induction elbow and warm air and oil heating to the air intake. The less preheating of the mixture the better, but a certain amount was unavoidable to prevent condensation and consequent freezing.

Butterfly throttles were fitted on modern air-cooled radial engines, and, owing to the fiercer acceleration when opening up for taxying with this type compared with the barrel type, the control levers should have as slow a movement as possible for the first part of their travel. For altitude control Mr. Fedden considered jet control more positive and progressive than vacuum control, and it also had the further advantage that with this type of control and a warm intake, the danger of blocking the air intake with snow was eliminated.

New Types of Installation

The lecturer thought that in this country we might not fully have realised the advantages of possible new types of installation for air-cooled radials. With the exception of the Handley Page "Hampstead," he did not know of any serious attempts to produce multi-engined radial installations, and he believed that there were very great possibilities in this respect. The greater the number of engines used the more outstanding the advantages of simplicity, low weight, cheapness and ease of installation. Slides were shown of various new installations, one of them being a photograph of the Caproni, illustrated in FLIGHT recently, in which the two "Jupiters" were placed in tandem. Mr. Fedden said that he realised that this type of installation was not popular in this country, and that he dare not express an opinion on the aerodynamic "pros and cons" of such a machine, but he ventured to show this slide as from figures obtained from this installation extremely good results were claimed over a period of 60 hours' testing, and no trouble whatever had been experienced with the rear engine. If, Mr. Fedden said, this tandem scheme were found to be worthy of reconsideration, the difficulty of using full throttle with the rear engine in the case of the forward engine being out of commission was not insurmountable, and tests had already been made by the Bristol Company which showed that the necessary alterations could be made.

Turning to the subject of high-speed machines, Mr. Fedden stated that it had lately been suggested to him that, irrespective of diameter and consequent drag, the blunt nose of the radial engine on high-speed machines was a serious drawback. If such should be the case, he saw no reason why the radial air-cooled engine designer should not improve this by suitable design in co-operation with the aeroplane designer. Further, he saw no reason why an air-cooled radial should not be entirely cowled in. Diagrams were shown of how a very pointed nose could be obtained in this way by a forward extension of the front crank-case cover and propeller shaft.

In conclusion, Mr. Fedden referred to the remarks made by Air Chief-Marshal Sir Hugh Trenchard in his address to Cambridge University Aeronautical Society, in which the latter pointed out that in the event of another war the wastage of aeroplanes would be so great that the country which could most rapidly re-equip itself would most probably win the war. "If," Mr. Fedden said, "a really large output of 400 to 450 h.p. engines were required at short notice, I submit there is no answer to the problem at the present time, except the air-cooled radial. With these very definite advantages in favour of the air-cooled radial, it seems desirable that every effort should be made to obtain co-operation between the aeroplane and engine designer with a view to bringing the installation of these engines to a higher stage of perfection."

The Discussion

The Chairman, Sir Sefton Brancker, then read letters from Mr. H. P. Folland and Mr. Tinson touching upon various points in the paper. Mr. Tinson queried the utility of ascertaining the polar moment of inertia. Sir Sefton said he was glad to know that the difficulty of snow blocking up the engine had been overcome. In civil aviation the question of removing and replacing an engine was important, and he would like to know if the lecturer could give some idea of how many man-hours it would take to change a radial air-cooled. On the subject of head resistance of radials, Sir Sefton pointed out that in the case of the de Havilland 50 on which Cobham is at present on his way to the Cape, it had been found that the machine had exactly the performance it was expected to have on a basis of the extra power of the "Jaguar" as compared with the "Puma," without making any allowance for the difference in head resistance.

Mr. Ford pleaded for greater control on the part of engine designers of installation. He raised the point as to the drag to weight ratio of engines of various types, pointing out that an investigation was required, and called attention to the importance of oil cooling and oil cleaning problems. The subject of engine starters had not been touched upon in the paper, but was important. Gas starters had done yeoman service in the past but entailed an addition of weight.

Wing-Commander Hynes agreed with Mr. Ford as to the value of obtaining figures for drag-weight ratio and said it was one of those cases where an answer of yes or no was expected when no such answer was possible. In high-speed machines the ratio might be equal to about 20. The radial engine was very short and gave a blunt nose, and if the shaft was lengthened there was danger of torsional vibration. He did not agree with the lecturer on the point of fire risk. The addition of a silencer did, he thought, add to the risk. The view that maximum oil circulation was desirable might have to be modified. Oil was found difficult to get to give up its heat. When using a very cold medium for cooling there was a tendency for the oil to form a film of viscous oil on the tube walls which seemed to insulate the rest of the oil. Figures available showed an amazing variation in oil circulation, being as low as 18 gallons per hour in one engine, and as high as 450 gallons per hour in another. He thought a very good case could be made out for minimum rate of oil circulation.

Mr. Bolas, on the subject of oil cooling, thought the oil was not the proper place to get the heat out. He referred to some experiments made by him in which the cylinders of a Bristol "Lucifer" engine were jacketed individually. Here the cylinders themselves kept cool, and there was then no need to cool the oil. The trouble with air cooling at the moment, he thought, was that it was always obtained in the form of head resistance whereas it should be in the nature of skin friction.

Col. Bristow said the question of drag was the major consideration, and if the subject was considered from the ground up there seemed to be no reason why the drag should be excessive. He referred to the replacing of the Rolls-Royce engines on a Handley Page 0/400 with Jupiters, and said that with the alleged high-drag radials the machine was actually faster. He saw no reason why we should not have a radial air-cooled in the next Schneider Cup race.

Major Mayo wanted to know if some early tests on a model of a Westland "Weasel" fuselage, with and without projecting cylinders, had been continued, and also how much of the cylinders must be exposed, and what was the effect on engine of temperature variations. The question of reduction gearing for radials had not been mentioned. How much extra weight would be entailed, and would the eccentric cowling add a great deal to the resistance. He did not agree that the radial could be contemplated for the next Schneider, as he thought something like 1,000 h.p. would be required, which seemed difficult to attain without great increase in area.

Among the replies given by Mr. Fedden we have space to record a few only. The polar moment of inertia was wanted for estimating the damping and the natural period. As a "stunt" a "Jupiter" had been removed from a machine and replaced in 3¾ hours. A longer propeller shaft could be built without danger of breaking. Full power could be maintained over a range of temperatures of 65° C. A geared "Jupiter" had been produced and weighed 97 lbs. extra. The reduction gear was concentric. Finally, he was hoping with every confidence to pass type tests at a weight of 1 lb. per h.p.

FLIGHT

THE ROYAL AIR FORCE

London Gazette, November 24, 1925

General Duties Branch

Pilot Officer G. D. Gibson is promoted to the rank of Flying Officer; June 15. Flying Officer G. D. Gibson relinquishes his short-service commn. on account of ill-health; Nov. 25. The short-service commn. of Pilot Officer on probation T. H. Rowlands is terminated on cessation of duty; Nov. 25.

Stores Branch

Flight-Lieut. W. R. Fairbairn resigns his permanent commn; Nov. 25.

Medical Branch

H. I. Clapperton (temp. Lieut. Dental Surgeon, General List, Army) is granted a temp. commn. as a Flying Officer on attachment to the R.A.F.; Nov. 2. He will continue to receive emoluments from Army Funds.

Reserve of Air Force Officers

F. R. Matthews is granted a commn. in Class A.A., General Duties Branch, as a Pilot Officer on probation; Nov. 9.

Memorandum

No. 180,404 Cadet L. V. Cahill is granted an honorary commn. as a Sec. Lieut., with effect from the date of his demobilization.

ROYAL AIR FORCE INTELLIGENCE

R.A.F. INTELLIGENCE

Appointments.—The following appointments in the Royal Air Force are notified :—

General Duties Branch

Air Commodores: J. G. Hearson, C.B., C.B.E., D.S.O., to H.Q. Special Res. and Aux. Air Force on appointment as Air Officer Commanding, 1.12.25. R. H. Clark-Hall, C.M.G., D.S.O., to H.Q. Mediterranean to command, 14.11.25.

Group Captains: C. T. Maclean, D.S.O., M.C., to Station H.Q., Hinaidi, Iraq, 18.11.25. P. H. L. Playfair, M.C., to H.Q. Coastal Area for duty as Chief Staff Officer on ceasing to be non-effective, 16.11.25.

Wing Commanders: J. T. Babington, D.S.O., to H.Q., Iraq, 18.11.25. M. Spicer, to No. 7 Group H.Q., Andover, for Tech. Staff duties, 23.11.25. C. W. H. Pulford, O.B.E., A.F.C., to Cairo-Cape Flight, Northolt, to command, 6.11.25.

Flight Lieutenants: A. Chapman and V. R. Scriven, A.F.C., to R.A.F. Depot on transfer to Home Estab.; 17.10.25. A. Ferris to R.A.F. Cadet College, Cranwell, on transfer to Home Estab.; 30.10.25. R. M. C. Macfarlane, M.C., and R. Grice, D.F.C., to R.A.F. Depot on transfer to Home Estab.; 30.10.25. J. M. J. C. J. I Rock de Besombes to Central Flying Sch., Upavon, on transfer to Home Estab.; 30.10.25. A. T. S. Lequen de Lacroix, to R.A.F. Depot on transfer to Home Estab.; 25.10.25. J. F. T. Barrett, D.F.C., to Air Ministry; 26.11.25. H. T. Lydford, A.F.C., to No. 2 Flying Training Sch., Digby, on transfer to Home Estab.; 30.10.25.

The undermentioned Flight Lieutenants are all posted to R.A.F. Depot on transfer to Home Estab., with effect from 30.10.25 :—H. Cockerell, O.B.E., R. A. Courtney, M.B.E., T. E. Salt, A.F.C., F. St. J. Woollard, A.F.C., T. P. Y. Moore, F. McB. Paul, G. E. Gibbs, M.C., L. H. Browning, M.C., D.F.C., C. W. Attwood, J. Bussey, H. E. Searson, D.F.C., and J. K. A. Jeakes, D.F.C.

Squadron Leaders: F. J. Linnell, O.B.E., to H.Q. Air Defences of Great Britain, 9.11.25. D. E. Stodart, D.S.O., D.F.C., to No. 84 Sqdn., Iraq, 18.11.25. E. R. Vaisey, to Aircraft Depot, Iraq, 18.11.25. J. O. Archer, C.B.E., to No. 31 Sqdn., India, 18.11.25. J. S. T. Bradley, O.B.E., to No. 7 Sqdn., Bircham Newton, on transfer to Home Estabt., 19.11.25. A. S. C. S. Maclaren, O.B.E., M.C., D.F.C., A.F.C., to No. 208 Sqdn., Egypt, 18.11.25.

Flight Lieutenants: F. McB. Paul, to No. 5 Flying Training Sch., Sealand, 23.11.25. B. J. Silly, M.C., D.F.C., to H.Q., Egypt, 8.10.25. J. R. F. Randell, D.F.C., to No. 4 Flying Training Sch., Egypt, 1.10.25. J. R. I. Scambler, A.F.C., and C. H. Stilwell, to H.Q., India, 18.11.25. J. W. Young, M.B.E., to No. 1 Wing H.Q., India, 18.11.25. C. R. Strudwick, to No. 31 Sqdn., India, 18.11.25. A. S. G. Lee, M.C., to No. 5 Armoured Car Co., Iraq, 18.11.25. E. J. D. Townesend, to Aircraft Depot, Iraq, 18.11.25. A. F. Lang, M.B.E., and A. C. Stevens, to H.Q., Iraq, 18.11.25. C. Findlay, D.F.C., to No. 6 Sqdn., Iraq, 18.11.25. R. L. Sweeny, to No. 4 Armoured Car Co., Iraq, 18.11.25. K. A. Meek, M.B.E., to H.Q., Iraq., 18.11.25. C. F. Chinery, to No. 2 Armoured Car Co., Palestine, 18.11.25. E. C. Emmett, M.C., D.F.C., to Cairo-Cape Flight, Northolt, instead of to R.A.F. Depot, as previously notified, 9.11.25. P. H. Mackworth, D.F.C., to Cairo-Cape Flight, Northolt, 16.11.25. E. J. L. Hope, A.F.C., to Cairo-Cape Flight, Northolt, 9.11.25. L. E. M. Gillman, to Cairo-Cape Flight, Northolt, 18.11.25. J. A. Gray, D.F.C., to Experimental Section, R.A.E., S. Farnborough, 30.11.25.

Flying Officers: R. S. Bruce, M.B.E., J. F. Clark, A. Page, H. Little, and P. D. Baker, to R.A.F. Depot on transfer to Home Estab.; 30.10.25. J. W. Jean, D.S.M., to No. 4 Apprentices Wing, Cranwell; 16.11.25. B. J. J. Nimmo to No. 2 Armoured Car Co., Palestine; 17.10.25. R. H. W. Empson to R.A.F. Depot on transfer to Home Estab.; 17.10.25. H. T. Satterford and F. W. Long, to R.A.F. Depot on transfer to Home Estab.; 30.10.25. G. E. Litton to No. 1 Sch. of Tech. Training (Apprentices), Halton, on transfer to Home Estab.; 18.11.25. T. H. French, D.F.C., to Central Flying Sch., Upavon, on transfer to Home Estab.; 30.10.25. W. F. Langdon, to No. 1 Stores Depot, Kidbrooke, on transfer to Home Estab.; 30.10.25. O. B. Swain to No. 99 Sqdn., Bircham Newton; 12.11.25. J. de la P. B. Preston, D. H. Geeson, and A. W. Crees, to R.A.F. Depot on transfer to Home Estab.; 17.10.25.

Flying Officers: C. H. Johnson, to Inland Water Transport, Iraq; 1.11.25. F. H. Davis, to No. 4 Apprentices' Wing, Cranwell; 26.11.25. P. D. Baker, to No. 5 Flying Training Sch., Sealand; 23.11.25. R. Collins, to Marine Aircraft Experimental Estab., Felixstowe; 23.11.25. E. S. Brinsmead, to Marine Aircraft Experimental Estab., Felixstowe; 30.11.25. A. A. C. Hyde, to No. 70 Sqdn., Iraq; 18.11.25. R. C. B. Brading, D.F.C., to Station Commandant, Basrah; 18.11.25. J. S. Harrison, to No. 5 Armoured Car Co., Iraq; 18.11.25. C. H. Flinn, to No. 55 Sqdn., Iraq; 18.11.25. T. J. E. Thornton, D. M. Fleming, and J. R. Brown, D.F.C., to H.Q., Iraq; 18.11.25. J. W. Caddy, to Inland Water Transport, Iraq; 18.11.25. G. G. H. Du Boulay to No. 45 Sqdn., Iraq; 18.11.25. J. E. L. Drabble, to Stores Depot, Iraq; 18.11.25. F. C. Farrington, M.C., and C. F. Steventon, to No. 6 Sqdn., Iraq; 18.11.25. R. H. S. Spaight, to No. 84 Sqdn., Iraq; 18.11.25. W. M. M. Hurley, N. S. Paynter, C. P. M. B. Caillard and S. F. Coleman, to Aircraft Depot, India; 18.11.25. C. N. H. Bilney, A. B. Smith, M.C., and F. V. Beamish, to No. 5 Sqdn., India; 18.11.25. B. H. C. Russell, to No. 20 Sqdn., India; 18.11.25. D. C. Prance, to No. 60 Sqdn., India; 18.11.25.

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IN PARLIAMENT

Airships

CAPT. GARRO-JONES, on November 18, asked the Secretary of State for Air what stage of development has been reached in the construction of the two new airships?

Sir S. Hoare: The preliminary research and design stage may be regarded as completed, but before construction can commence there are certain further tests to be carried out both by the Airship Guarantee Company and by the Air Ministry.

Foreign Engines and Machines

REAR-ADMIRAL SUETER asked the Secretary of State for Air if he will explain why the Royal Air Force aeroplanes used on the flight from Cairo to Kano, Nigeria, to show the British flag, were fitted with American engines, and whether no machines fitted with the latest British engine were available for this flight?

Sir S. Hoare: The flight referred to was intended as a training exercise on an extended scale for a detachment of a squadron normally stationed at Cairo, using the ordinary service equipment of the squadron. The object would not have been met if a specially equipped squadron had been sent out for the flight, and greater expense would have been involved. I may add that the present use of Liberty engines in service squadrons is due to the existence of large war stocks of such engines, which are still being utilised in the interests of economy.

Rear-Admiral Sueter asked the Secretary of State for Air if he will give an assurance to the House that in the Cape-to-Cairo flight, which it is understood will be undertaken next spring, only British machines and British engines will be used; and whether he will see that the Air Ministry do not give large air contracts to foreign countries when they can be placed at home, and that the foreign orders are confined to experimental machines, engines, and sustenants only?

Sir S. Hoare: I am glad to be able to give my hon. and gallant friend an assurance that British engines and machines will be used in the forthcoming flight from Cairo to the Cape by the Royal Air Force. As regards the second part, it is the general policy of the Air Ministry to obtain their requirements from British sources, wherever possible, and this policy is only departed from for experimental purposes. The Ministry must naturally reserve to themselves the power to profit by any aeronautical advance, even if a purchase from a foreign country is thereby rendered necessary, but in such cases it is my intention to ensure that further production shall be carried out in British territory.

Mr. Maclean asked whether an order has been placed by the Government with American firms for the supply of aeroplane engines; whether this type is different from any which can be obtained in Britain; whether any British firm was asked to tender; whether there was any difference in the price; and, if so, by how much was the British firm lower or higher than the American firms?

Sir S. Hoare: The facts of this case are as follows :— An experimental order has been placed for certain aircraft complete with engines with a British firm who elaborated the design of the machines on the basis of incorporating certain features dependent on the use of an American engine, differing in certain respects from the standards laid down for British engines. The order necessitated the purchase from this British firm of a certain number of American engines. No direct order was placed by the Air Ministry with an American firm, and as no other type of engine was suitable for the aircraft, the question of comparative prices does not arise.

R.A.F. Relations to Navy

REAR-ADMIRAL SUETER asked the Secretary of State for Air whether the instructions given in 1923 on the relations of the Air Force to the Navy are working quite satisfactorily; and if any changes are considered desirable?

Sir S. Hoare: According to my information, the answer to the first part of the question is, broadly, in the affirmative, but it is always possible that further experience may disclose the desirability of some modifications in the method of carrying out these instructions in practice.

Royal Air Force

SIR F. HALL asked the Prime Minister whether, among other avenues of economy in the public service, the Government will consider the possibility, in the interests both of efficiency and economy, of abolishing the present independent organisation of the Royal Air Force; and if he will appoint a special committee, which shall include a proportion of members, unbiased by official interests, to inquire into and report upon the question of effecting economies of administration in this direction?

The Prime Minister: This question, together with all other questions affecting possible economies in the fighting services, falls within the scope of the Colwyn Committee.

Capt. Wedgwood Benn: Do we understand that the Government have departed from the hitherto settled policy of having an independent Air Force?

The Prime Minister: No, they have departed from no policy at present.

Sir F. Hall: If there is a possibility of increasing efficiency and reducing the cost, would any harm be done by setting up a perfectly independent committee to inquire into this subject?

The Prime Minister: That question does not arise.

Sir F. Hall: But it is the question on the paper.

The Prime Minister: Then I have answered it.

Aerodrome, Boscombe Down (Sale and Repurchase)

SIR A. HOLBROOK, on November 23, asked the Secretary of State for Air what was the rental paid to the owners of the land on which the Old Sarum Aerodrome at Salisbury was erected in the War period; whether he is aware that the whole of the buildings and other materials were handed over to the owners as compensation for any expense that they might have to incur in removing these buildings and restoring the land to its condition when taken over; and whether the buildings were subsequently repurchased from the owners and at what price?

Sir S. Hoare: The Old Sarum Aerodrome has been continuously occupied by the Air Force since the end of the War, and I assume that my hon. and gallant Friend is referring to the neighbouring aerodrome at Boscombe Down. The facts in regard to Boscombe Down are these: The land was occupied by the Department before relinquishment at a compensatory rental of £100 16*s.* 5*d.* per annum, assessed on an actual loss basis and not in relation to freehold value. When the aerodrome was given up after the War, the buildings were sold to the owners of the land for £1,100, the owners waiving the very considerable claim in respect of re-instatement which otherwise they would have had. When last year it became necessary, as a result of the new Air Force programme to re-acquire the aerodrome, the land (283 acres) and the buildings were purchased for £15,000, which included claims in respect of severance, tenant right and injurious affection to the farm generally.

Bombing Aircraft

SIR A. SINCLAIR asked what would be the greatest weight of bombs which could be carried by the largest bombing machine known to be in the possession of any European Power to-day, on the assumption in one case that the return journey was one of 1,000 miles, and in another case that the return journey was one of 300 miles?

Sir S. Hoare: So far as I am aware, other European Powers do not publish this information as regards their bombing aircraft, and I regret that it would not be in the public interest to give the data desired by the hon. and gallant Member in respect of British bombing aircraft.

Parachutes

SIR F. SYKES asked if arrangements have yet been completed for the manufacture in the United Kingdom of any of the parachutes ordered in America; and, if so, what proportion of the total under order will be so manufactured?

Sir S. Hoare: Under the contract for the supply of parachutes, about one-third of the initial order and all future supplies are to be manufactured in this country, and it is anticipated that delivery from this source will commence by July next.

PERSONALS

Married

Flying Officer JOHN ROY ASTIN, R.A.F.O., youngest son of Mr. and Mrs. W. Astin, West View Road, Keynsham, was married, on October 28, at St. John the Baptist's Church, Keynsham, to PHYLLIS MARGARET, only daughter of Mr. and Mrs. P. GROUT, Durley Park, Keynsham.

Flight-Lieut. J. ROSS BELL, D.F.C., son of Mrs. Bell, and the late Dr. Frank Oliphant Bell, of Wareham, was married on November 4, at St. Augustin's Church, Bournemouth, to CONSTANCE, daughter of Mr. and Mrs. H. G. NEW, of Bournemouth.

S. W. BLIGHT, Flight-Sergt., R.A.F., youngest son of Mr. and Mrs. J. Blight, was married on November 17, at St. George's Church, Modbury, Devon, to FLORENCE BENWELL, third daughter of Mr. and Mrs. HODDER, Moorland View, Modbury.

Flight.-Lieut. STANLEY MILES PARK, R.A.F., second son of Charles R. Park, of 44, Woodstock Avenue, N.W.11, formerly of Minster, Isle of Thanet, was married on October 3 to FLORENCE FURNIVAL, younger daughter of H. SURTEES CHAPMAN and Mrs. CHAPMAN, of Standon, Hertfordshire.

CORRESPONDENCE

The Editor does not hold himself responsible for opinions expressed by correspondents. The names and addresses of the writers, not necessarily for publication, must in all cases accompany letters intended for insertion in these columns.

THE PROPELLERS IN SCHNEIDER CUP RACE

[2104] With reference to your statement with regard to the Fairey Reed propellers and your apology in your issue of last week.

While being in no way connected with the spreading of the rumours, we have looked into the points raised in so far as they concern the propellers received by the Gloster Company.

We are bound to say that we are not satisfied with the performance of these propellers and this is a matter which we are taking up with the makers. It was obvious to those who were present at Baltimore during the race that the propellers fitted to the British machines were of an earlier design and type to those fitted to the U.S.A. machines and were not similar as implied in advertisement of November 5 Fairey-Reed all-metal airscrew.

To avoid any misstatement or misapprehension, we feel called upon to take notice of your apology.

THE GLOUCESTERSHIRE AIRCRAFT CO., LTD.
DAVID LONGDEN,
Managing Director

SOCIETY OF MODEL AERONAUTICAL ENGINEERS

ON Tuesday, November 17, Dr. A. P. Thurston gave his lecture to the Members on "The Advantages gained from Model Aeroplane Construction." For demonstration he brought with him models made twenty years ago by well-known aero-modelists who are now some of the foremost constructors and designers of present-day full-size aircraft.

Dr. Thurston has presented to the Society his collections of model aeroplanes, etc., which he has had in his possession for over twenty years.

Dr. Thurston offered a first prize subject to two others being given for models of "Autogiro" Type Competition. Mr. W. E. Evans, in conjunction with Mr. Small, spontaneously came forward and offered the other two. The Society is greatly indebted to these gentlemen.

The Research Committee will now draw up details for same.

The result of the Photographic Competition for 1925 was as follows:—

1st Prize Mr. W. E. Evans.
2nd ,, Mr. B. K. Johnson.
Ladies—
1st ,, Miss A. Walsh.
2nd ,, Mrs. B. K. Johnson.

The following rules for a Propeller Competition arranged by Mr. Johnson and Mr. Evans have been drawn up, the prizes again being kindly given by Mr. Evans.

1. Propeller to be a left-hand pusher (right-hand tractor), which may be two- three- or four-bladed, and may be made of any materials.
2. Diameter to be 10 ins.
3. Pitch to be 13 ins. Pitch angles to be 25 degrees at ½ in. from tip, and 34½ degrees at 2 ins. from tip. Maximum error allowed plus or minus ½ degree.
4. Boss to be bored to take ⅛ in. spindle.
5. The winning screw to be the one which records the highest maximum thrust on the testing apparatus. Points may be deducted if the diameter or the pitch is inaccurate.
6. Propellers must reach Mr. W. E. Evans, 20, Thurlby Road, Wembley, not later than January 1, 1926. Results will be announced at the meeting on January 12, 1926.

A. E. JONES, *Hon Secretary.*

AERONAUTICAL PATENT SPECIFICATIONS

Abbreviations: Cyl. = cylinder; i.c. = internal combustion; m. = motor. The numbers in brackets are those under which the Specifications will be printed and abridged, etc.

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Published December 3, 1925

16,503. R. A. BRUCE AND PETTERS, LTD. Aircraft control mechanism. (242,326.)
22,887. MAYBACH MOTORENBAU GES. Control mechanism. (222,506.)
24,202. DOUGLAS MOTORS, LTD., and S. L. BAILEY. Transmission shock-absorbers. (242,413.)

APPLIED FOR IN 1925

Published December 3, 1925

476. J. L. EDEN. Helicopters. (242,477.)
8,835. A. FRISCH. Rotary engines. (242,522.)
14,885. R. ESNAULT-PELTERIE. Progressive change-speed devices. (235,562.)
17,333. SOC. RATEAU. Method of mounting shafts of rotary apparatus. (237,586.)

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